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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 20

Application Number: 09/491,284
Filing Date: January 26, 2000
Appellant(s): GITIS ET AL.

David M. Sigmund
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 11, 2002 and attached to paper number 19.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences (if any) which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that the claims stand or fall together as set forth on page 6 and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

4,819,091	Brezoczky et al.	4-1989
4,901,185	Kubo et al	2-1990
4,926,274	Saitoh et al.	5-1990

5,541,789 Fukuoka et al. 7-1996

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim 10 is rejected under 35 U.S.C. 102(e) as being anticipated by Fukuoka et al (US Pat 5541789). Figure 7 of Fukuoka et al shows: a slider 1 with a transducer 4 for transferring information to and from a rotating disk 3; a pad (the U-shaped bottom planar surface of the slider 1 shown in figure 7) maintains substantially continuous contact with the disk 3 during the read write operations; the pad has a leading edge which is U-shaped due to the chamfering of the front side surfaces; the pad has a trailing edge (far right hand side of the pad in figure 7) that is perpendicular to the moving direction of relative motion between the disk 3 and slider 1 (see figure 1); and the width of the leading edge of the pad shown in figure 7 is substantially narrower than the width of the trailing edge of the pad.

Claims 1, 2, 10-12, 17, 18, 26, 31, 33-39 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Brezoczky et al (US Pat 4819091) (see Figs. 2 and 5). Figures 2 and 5 of Brezoczky et al show: With regard to claims 1 and 2, a recording head for reading/writing information with respect to a rotating disk 20, the head including a pad 52 having a working surface in contact with the rotating disk 20 during reading/writing, a magnetic pole tip structure 17 embedded (i.e. made an integral part of) in the pad 52, the pad 52 having a leading edge (apex of the triangle, see figure 2) facing the rotation direction of the disk 20 and a trailing edge to which the magnetic pole tip structure 17 is embedded, wherein the leading edge has a narrower width than the trailing edge due to the V-shape of the triangle.

With regard to claims 10-12, 17, 18, 26, 31, 33-39 Brezoczky et al shows a slider 56 with a transducer 17 for transferring information to and from a rotating disk 20; a V-shaped (wedge shaped) flat pad 52 with a uniform thickness maintains substantially continuous contact with the disk 20 during the read write operations; the pad 52 has a leading edge which is V-shaped; the pad 52 has a trailing edge (to which the transducer 17 is made integral with) that is perpendicular to the moving direction of relative motion between the disk 20 and slider 56 (see figure 2); and the width of the leading edge of the pad 52 shown in figure 5 is substantially narrower than the width of the trailing edge of the pad 52 so that the trailing straight edge of the pad is the widest part of the pad. The pad 52 would inherently deflect debris due to the V-shape (wedge shape) as claimed in claim 35.

Claims 13, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brezoczky et al. Brezoczky et al shows a V-shaped slider/pad in Figure 5 that contacts the recording disk during reading/writing. However, Brezoczky et al does not show the wide part of the V-shaped portion being spaced from the trailing edge of the pad. The Examiner takes Official notice that it is old and well known in the art to space the trailing edge of a slider pad from the trailing edge. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to space the pad from the trailing edge as doing this would decrease the amount of contact between the disk and pad, thus creating less friction and wear therebetween.

Claims 3, 4, 14-16, 20-25, 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brezoczky et al in view of Fukuoka et al. Brezoczky et al shows a V-shaped slider/pad in Figure 5 that contacts the recording disk during reading/writing. However, Brezoczky et al does not show the pad being U-shaped, parabolic shaped or hyperbolic-shaped wherein the wide part

of the pad is spaced from the trailing edge. With regard to the specific shape, Fukuoka et al shows a U-shaped pad in Figure 7 wherein Fukuoka et al states in col. 10, lines 30-32 that the pad may be "a parabola, circle, or oval." Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to re-shape the pad of Brezoczky et al into one of a U-shape, parabolic, or hyperbolic shape as taught by Fukuoka et al. The rationale is as follows: one of ordinary skill in the art would have been motivated re-shape the V-shaped pad of Brezoczky et al as doing this would permit the sliding characteristics of the pad to be altered to the specific needs of various dick drives. No unobvious result is seen in changing the shape of the pad of Brezoczky et al when viewed with the teachings of Fukuoka et al, as each of the V-shape, U-shape, parabolic shape, and hyperbolic shapes all would permit contact with the disk during operation.

Secondly, with regard to the wide part of the pad being spaced from the trailing edge of the pad, the Examiner takes Official notice that it is old and well known in the art to space the trailing edge of a slider pad from the trailing edge. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to space the pad from the trailing edge as doing this would decrease the amount of contact between the disk and pad, thus creating less friction and wear therebetween.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brezoczky et al in view of Kubo et al (US Pat 4901185). Brezoczky et al shows a V-shaped slider/pad in Figure 5 that contacts the recording disk during reading/writing. However, Brezoczky et al does not show the leading edge of the pad being spaced from the leading edge of the slider. Kubo et al shows a contact slider in Figure 10 that has a leading edge of a pad 104 spaced from a leading edge of the slider body due to the tapered portion 40. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a taper to the pad of Brezoczky et al in order to space the leading edge of the pad from the leading edge of the slider

as taught by Kubo et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to taper the leading edge of Brezoczky et al's pad as doing this would permit less contact area between the pad and disk, thereby creating less friction and wear between the pad and disk.

Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brezoczky et al in view of Kubo et al as applied to claim 27 above, and further in view of Fukuoka et al. Brezoczky et al shows a V-shaped slider/pad in Figure 5 that contacts the recording disk during reading/writing while Kubo et al shows the pad spaced from the leading edge of the slider. However, neither Brezoczky et al nor Kubo et al shows the trailing edge of the slider being the trailing edge of the pad while also not showing width of the leading edge of the slider being the same as the width of the trailing edge of the slider. Fukuoka et al shows a slider 1 with a U-shaped pad in Figure 7 wherein the trailing edge of the pad is the trailing edge of the slider. The width of the leading edge of the slider is identical to the width of the trailing edge of the slider. Therefore, with regard to the trailing edge of the pad being the trailing edge of the slider, it would have been obvious to one of ordinary skill in the art at the time the invention was made to move the transducer of Brezoczky et al from the trailing edge of the slider to somewhere in the middle of the pad as performed by Fukuoka et al, thereby making the trailing edge of the slider the trailing edge of the pad. The rationale is as follows: one of ordinary skill in the art would have been motivated to make the trailing edge of the slider the trailing edge of the pad as doing this would remove the transducer from the exposed trailing edge of the slider and move it to a more protected area within the pad, thus decreasing the amount of potential damage to the transducer from collisions.

With regard to the widths of the trailing and leading edges of the slider being the same, it would have been obvious to one of ordinary skill in the art at the time the invention was made to

make the widths of the slider in Brezoczky et al the same as taught by Fukuoka et al. The rationale is as follows: one of ordinary skill in the art would have been motivated make the widths of the leading and trailing edges of the slider the same as doing this would simplify the manufacturing process by permitting the slider bodies to be cut into simple blocks from a single wafer, thus eliminating the need for more complex diagonal cuts of the wafer as would be the case in the Brezoczky et al slider.

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brezoczky et al in view of Kubo et al as applied to claim 27 above, and further in view of Saitoh et al (US Pat 4926274). Brezoczky et al shows a V-shaped slider/pad in Figure 5 that contacts the recording disk during reading/writing while Kubo et al shows a tapered pad. However, neither Brezoczky et al nor Kubo et al shows the distance between the leading edge of the pad and the trailing edge of the slider being substantially less than a distance between the leading edge of the pad and the leading edge of the slider as recited in claim 30. Saitoh et al shows a slider pad in Figure 1 that shows the distance between the leading edge of the pad 7 and the trailing edge of the slider being substantially less than a distance between the leading edge of the pad 7 and the leading edge of the slider. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the distance between the leading edge of the pad and the trailing edge of the slider being substantially less than a distance between the leading edge of the pad and the leading edge of the slider as taught by Saitoh et al as doing this would again permit less area of the pad to contact the disk during operation, thus decreasing the amount of friction and wear that occurs between the disk and slider.

(11) Response to Argument

Appellant asserts on pages 7 and 8 that Fukuoka et al does not show a slider that includes a pad wherein the leading edge is narrower than the trailing edge. However, the examiner maintains that, with regard to the Fukuoka et al reference, Figure 7 shows a slider 1 with an integral landing pad that faces the disc during recording/reproducing (the pad is created in part by the chamfered front edges so as to create a U-shaped front edge of the landing pad). Claim 10 specifically sets forth a "slider, comprising.....a pad" to which Fukuoka et al shows a slider 1 with a U-shaped pad facing the disk. The pad of the slider of Fukuoka et al maintains contact with the disk during reproducing and recording operations. It is noted that Appellant's reference to Application 08/161,234 and the Coughlin reference at page 8 is irrelevant to the current issues of the instant appeal, as the Coughlin reference has not been cited in any of the instant appealed rejections.

Appellant asserts on page 10 that Brezoczky et al does not show a slider that includes a wedge-shaped pad wherein a magnetic pole tip structure is embedded within the pad. However, the examiner maintains that, Brezoczky et al shows a slider in Figure 5 with a pad 52 combined with the slider base 56. The pad 52 is wedge shaped and has a magnetic pole tip structure 17 "embedded" in the pad. Specifically, Webster's II New Riverside University Dictionary, 1988 edition, sets forth "embed" as "To make an integral part of." Therefore, the examiner maintains that the poles 17 of Brezoczky et al are an integral part of the slider and pad shown in figure 5.

Appellant further asserts on pages 11 and 12 that Brezoczky et al does not show the wide part of the wedge shaped portion spaced from the trailing edge. However, the examiner maintains that spacing the edge of a slider pad from the trailing edge is old and well known in

the art of magnetic head sliders, and therefore, it would have been within the skill level of a routineer in the art to have spaced the edge of the pad from the trailing edge. The pad would still be in contact with the disk, but with less surface area of the pad in contact, less wear on the disk and head would occur because of the decrease in corresponding friction.

Appellant further asserts on pages 12 and 13 that Brezoczky et al fails to teach the pad having a U-shape, parabolic shape, or hyperbolic shape and that it is "unclear how read/write head 17 could be properly formed on surface 58, which would be curved." It is the examiner's position that the instant rejection involved the use of Fukuoka et al as the secondary teaching of slider pad's with various shapes, which include U-shapes, parabolic shapes, and hyperbolic shapes. As Brezoczky et al already shows a slider pad with a triangle (wedge or V) shape, one of ordinary skill in the art would have found it obvious to change the shape of the pad into a U-shape, etc. as taught by Fukuoka et al. The read/write head 17 of Brezoczky et al would still be formed on the flat planar trailing edge of the slider. Changing the V-shaped slider pad into a U-shaped slider pad would only effect the shape of the leading edge of the pad, and not the trailing edge. Therefore, the read/write head 17 would be unaffected by a change in shape from V to U, V to parabolic, or V to hyperbolic.

Appellant further asserts on pages 13 and 14 that with regard to claim 27, Brezoczky et al does not show the leading edge of the pad spaced from the leading edge of the slider. However, the examiner maintains that spacing the leading edge of a slider pad from the leading edge of the slider is old and well known in the art of magnetic head sliders as taught by Kubo et al, and therefore, it would have been within the skill level of a routineer in the art to have spaced the leading edge of the pad from the leading edge of the slider. Kubo et al shows a contact slider in

Figure 10 that has a leading edge of a pad 104 spaced from a leading edge of the slider body due to the tapered portion 40. Kubo et al's taper at the leading edge of the pad effectively recedes the leading edge of the pad away from the leading edge of the slider, thereby decreasing the amount of surface area in contact with the disk. Therefore, the receded pad of Brezoczky et al would still be in contact with the disk, but with less surface area of the pad in contact, less wear on the disk and head would occur because of the decrease in corresponding friction.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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July 1, 2002
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